

Having thus defined the invention, the following is claimed:

1. A system for enabling an electric arc welder adapted to perform various welding processes using weld parameters and a welding wire or electrode, said system comprising a first receptacle for a first memory button having a chip loaded with digital data indicative of a specific welding procedure specification constituting a set of at least weld parameters, a specific weld process, electrical characteristics, and selected welding wire features; a second receptacle for a second memory button having a chip loaded with digital data indicative of recorded features of welding wire or electrode used by said welder; and, a disable circuit to disable said welder to process said specific welding procedure when said data indicative of recorded features of said welding wire fails to correspond with said data indicative of said selected welding wire features.

2. A system as defined in claim 1 wherein said wire features are selected from the group consisting of diameter and material.

3. A system as defined in claim 1 wherein said weld parameters include arc current and disable circuit to process said specific welding procedure specification when said welder can not provide said arc current.

4. A system as defined in claim 1 wherein said specific weld process includes constant voltage and constant current and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said specific weld process.

5. A system as defined in claim 1 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.
6. A system as defined in claim 4 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.
7. A system as defined in claim 3 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.
8. A system as defined in claim 2 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.
9. A system as defined in claim 3 wherein said specific weld process includes constant voltage and constant current and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said specific weld process.

10. A system as defined in claim 2 wherein said specific weld process includes constant voltage and constant current and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said specific weld process.
11. A system as defined in claim 2 wherein said weld parameters include arc current and disable circuit to process said specific welding procedure specification when said welder can not provide said arc current.
12. A system as defined in claim 6 wherein said weld parameters include arc current and disable circuit to process said specific welding procedure specification when said welder can not provide said arc current.
13. A system as defined in claim 12 wherein said wire features are selected from the group consisting of diameter and material.
14. A system as defined in claim 7 wherein said wire features are selected from the group consisting of diameter and material.
15. A system as defined in claim 14 wherein said specific weld process includes constant voltage and constant current and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said specific weld process.

16. A system as defined in claim 8 wherein said weld parameters include arc current and disable circuit to process said specific welding procedure specification when said welder can not provide said arc current.

17. A system as defined in claim 9 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.

18. A system as defined in claim 10 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.

19. A system as defined in claim 11 wherein said specific weld process includes constant voltage and constant current and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said specific weld process.

20. A system as defined in claim 19 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.

21. The system defined in claim 1 wherein said digital data of said first memory button is a code corresponding to said specific welding procedure specification.

22. The system as defined in claim 1 wherein said digital data of said first memory button contains said specific welding procedure specification.

23. The system as defined in claim 1 wherein said digital data of said second memory button is a code corresponding to said recorded features.

24. The system as defined in claim 1 wherein said digital data of said second memory button contains said recorded features.

25. The system as defined in claim 1 wherein said digital data of said first chip includes digital data defining selected qualification of the operating weldor and including a third receptacle for a third memory button having a chip loaded with digital data indicative of actual welding qualification of a weldor and a disable circuit disables said welder to process said welding procedure specification when said actual welding qualification fails to match and/or exceed said selected qualifications.

26. The system as defined in claim 25 including a program to update said digital data indicative of actual welding qualification in response to the processing of said specific welding procedure specification.

27. The system as defined in claim 1 wherein said digital data of said first chip includes data indicative of the selected shielding gas to be used in said weld procedure specification and including a third receptacle for a third memory button with digital data indicative of the actual shielding gas connected to said welder and a disable circuit to disable said welder to process said specific welding procedure when said actual shielding gas data fails to correspond with said data indicative of said selected shielding gas data.

28. A system for enabling an electric arc welder adapted to perform various welding processes using weld parameters and a welding wire or electrode, said system comprising a first receptacle for a first memory button having a chip loaded with digital data indicative of a specific welding procedure specification constituting a set of at least weld parameters, a specific weld process, electrical characteristics, and selected welding wire or electrode features; a second receptacle for a second memory button having a chip loaded with digital data indicative of an item in said set; and, a disable circuit to disable said welder to process said specific welding procedure when data indicative of said item fails to correspond with said data indicative of said item in said set.

29. A system as defined in claim 28 wherein said item is shielding gas.
30. A system as defined in claim 28 wherein said item is a feature of said wire or electrode.
31. A system as defined in claim 28 wherein said item is qualification of an operator.
32. A system as defined in claim 28 wherein said weld parameters include arc current and disable circuit to process said specific welding procedure specification when said welder can not provide said arc current.
33. A system as defined in claim 28 wherein said specific weld process includes constant voltage and constant current and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said specific weld process.
34. A system as defined in claim 28 wherein said electrical characteristics include AC, DC positive and DC negative and a disable circuit to disable said welder to process said specific welding procedure specification when said welder can not perform said electrical characteristic.
35. The system defined in claim 28 wherein said digital data of said first memory button is a code corresponding to said specific welding procedure specification.

36. The system as defined in claim 28 wherein said digital data of said first memory button contains said specific welding procedure specification.

37. The system as defined in claim 28 wherein said digital data of said second memory button is a code corresponding to said data indicative of an item in said set.

38. The system as defined in claim 28 wherein said digital data of said second memory button contains data indicative of said item.

39. A system for enabling an electric arc welder having a controller adapted to perform various welding processes using weld parameters and a welding wire, said system comprising a first receptacle for a first memory button having a chip loaded with digital data indicative of a specific welding procedure specification constituting a set of at least weld parameters, a specific weld process, electrical characteristics, and selected welding wire features; and, a circuit for loading said welding procedure specification into controller of said welder to control operation of said welder.

40. The system as defined in claim 39 wherein said digital data of said first chip includes digital data defining selected qualification of the operating welder and including a second receptacle for a second memory button having a chip loaded with digital data indicative of actual welding qualification of a welder; and, a disable circuit to disable said welder to process said welder

5 procedure specification when said actual welding qualification fails to match and/or exceed said selected qualifications.

41. The system as defined in claim 40 including a program to update said digital data indicative of actual welding qualification in response to the processing of said specific welding procedure specification.

42. A system as defined in claim 39 wherein the circuit includes a memory for storing said digital data and said first chip includes a coded data to output said digital data into said controller.

43. A system as defined in claim 39 wherein digital data from a network and said first chip includes coded data to output said digital data into said controller.

44. A system for enabling an electric arc welder adapted to perform various welding processes using weld parameters and a welding wire, said system comprising a first receptacle for a first memory button having a chip loaded with digital data indicative of a specific welding procedure specification and selected qualifications of the operating weldor; a second receptacle for
5 a second memory button having a chip loaded with digital data indicative of the actual qualifications of a specific weldor; and, a disable circuit to disable said welder to process said specific welding

procedure when data indicative of said actual qualifications fail to match and/or exceed said selected qualifications.

45. The system as defined in claim 44 wherein said digital data of said first chip includes selected qualification of the operating welder and including a third receptacle for a third memory button having a chip loaded with digital data indicative of actual welding qualification of a weldor and a disable circuit to disable said welder to process said welder procedure specifications when said actual welding qualification fails to match and/or exceed said selected qualifications.

46. A system for enabling an electric arc welder adapted to perform various welding processes using weld parameters and a welding wire or electrode, said system comprising a memory loaded with digital data indicative of a specific welding procedure specification constituting a set of at least weld parameters, a specific weld process, electrical characteristics, and selected welding wire or electrode features; a receptacle for a memory button having a chip loaded with digital data indicative of an item in said set; and, a disable circuit to disable said welder to process said specific welding procedure specification when data indicative of said item fails to correspond with said data indicative of said item in said set.

47. A system as defined in claim 46 wherein said item is shielding gas.

/ 48. A system as defined in claim 46 wherein said item is a feature of said wire or electrode.

/ 49. A system as defined in claim 46 wherein said item is qualification of an operator.

(50.) A system for controlling an electric arc welder, said system comprising a memory loaded with digital data indicative of a specific welding procedure specification constituting a set of weld parameters, a controller with a digital processing device having a memory for receiving said digital data and controlling said welder in compliance with said digital data, and a digital reading
5 interface to load said digital data from said memory to said section of said controller.

// 51. A system as defined in claim 50 wherein said memory device is a memory button having an IC chip loaded with said digital data and readable by touch and said interface is a touch contactor in a receptacle to touch said memory button when said button is placed into said receptacle.

/ 52. A system as defined in claim 50 including a receptacle for a memory button having a chip loaded with data indicative of an item in said set and a disable circuit to disable said welder when said specific welding procedure specification fails to correspond with said data indicative of said item in said set.

/ 53. A system as defined in claim 52 wherein said item is shielding gas.

- /54. A system as defined in claim 52 wherein said item is a feature of said wire or electrode.
- / 55. A system as defined in claim 52 wherein said item is qualification of an operator.
- / 56. A system as defined in claim 50 wherein said set of parameters of said welding procedure specification includes a specific parameter to be externally selected by a weldor, a station where a weldor selects said specific parameter, a circuit for limiting said selected specific parameter, and a circuit to implement said specific parameter by said welder.
- / 57. A system as defined in claim 56 wherein said limiting circuit limits the maximum value of said specific parameter.
- / 58. A system as defined in claim 57 wherein said limiting circuit limits the minimum value of said specific parameter.
- / 59. A system as defined in claim 56 wherein said limiting circuit limits the minimum value of said specific parameter.
- / 60. A system as defined in claim 59 wherein said station is a data entry device.

61. A system as defined in claim 56 wherein said station is a data entry device.

62. A system as defined in claim 51 wherein said set of parameters of said welding procedure specification includes a specific parameter to be externally selected by a weldor, a station where a weldor selects said specific parameter, a circuit for limiting said selected specific parameter, and a circuit to implement said specific parameter by said welder.

63. A system as defined in claim 62 wherein said limiting circuit limits the maximum value of said specific parameter.

64. A system as defined in claim 62 wherein said limiting circuit limits the minimum value of said specific parameter.

65. A system as defined in claim 50 wherein said set of parameters of said welding procedure specification includes a specific parameter relating to a characteristic of an external condition, an external probe for sensing said characteristic of said external condition and a circuit for disabling said welder when said characteristic is outside limits placed on said characteristic by
5 said loaded welding procedure specification.

66. A system as defined in claim 65 wherein said characteristic is temperature.

67. A system for controlling an electric arc welder at a weld station, said system comprising: a controller for the power supply and external drives at said weld station of said welder, said controller having a digital processing device having a section for receiving digital data and controlling said welder in compliance with said digital data, said data including a selected value for an external weld condition, a data entry station for an operator to select a level for said external condition and a logic network to compare said selected level and said selected value to create an action signal based upon said comparison.

68. A system as defined in claim 67 wherein digital data is a selected welding procedure specification having a high and low value for external condition.

69. A system as defined in claim 68 wherein said action signal is a signal selected from the class consisting a command signal setting said power supply or external drive to a given value for said external condition, a signal recording said condition, a signal to set said power supply at a value of external condition between a high and a low value, and a signal disabling welder when selected level is not within a selected deviation from said selected value.

70. A system as defined in claim 67 wherein said action signal is a signal selected from the class consisting a command signal setting said power supply or external drive to a given value for said external condition, a signal recording said condition, a signal to set said power supply at a

value of external condition between a high and a low value, and a signal disabling welder when
5 selected level is not within a selected deviation from said selected value.

71. A system as defined in claim 70 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

72. A system as defined in claim 69 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

73. A system as defined in claim 68 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

74. A system as defined in claim 67 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

75. A system as defined in claim 73 wherein said controller generates a command signal for said external condition to said power supply or external drive based upon said welding procedure

specification and said action signal, a sensor to read said external condition on a real time basis, and a circuit to disable said welder when said sensed external conditions deviate from said command signal.

// 76. A system as defined in claim 75 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

// 77. A system as defined in claim 68 wherein said controller generates a command signal for said external condition to said power supply or external drive based upon said welding procedure specification and said action signal, a sensor to read said external condition on a real time basis, and a circuit to disable said welder when said sensed external conditions deviate from said command
5 signal.

// 78. A system as defined in claim 77 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

// 79. A system as defined in claim 68 wherein said data entry station is separate from said weld station.

80. A system as defined in claim 67 wherein said data entry station is separate from said weld station.

81. A system as defined in claim 80 wherein said weld station is a robot.

82. A system as defined in claim 79 wherein said weld station is a robot.

83. A system as defined in claim 68 wherein said weld station is a robot.

84. A system as defined in claim 67 wherein said weld station is a robot.

85. A system for controlling an electric arc welder at a weld station, said system comprising: a controller for the power supply of said welder, said controller having a digital processing device with a memory for receiving digital data and controlling said welder in compliance with said digital data, a reading device to load control data containing a specific welding procedure specification into said memory, said control data including a selected level for an external condition, said controller generating a command signal for said external condition, a sensor to read said external condition on a real time basis and a comparator circuit to disable said welder when said external condition deviates from said selected level.

86. A system as defined in claim 85 wherein said external condition is a condition selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

87. A system as defined in claim 86 wherein one of said external drives is a wire feeder.

88. A system as defined in claim 85 wherein one of said external drives is a wire feeder.

89. A system as defined in claim 87 wherein one of said drives is a robot drive for travel speed during welding.

90. A system as defined in claim 86 wherein one of said drives is a robot drive for travel speed during welding.

91. A system as defined in claim 85 wherein one of said drives is a robot drive for travel speed during welding.

92. A method of controlling an electric arc welder having a power supply, external drives, and a controller for said power supply and drives, said method comprising:

(a) loading digital data containing a welding procedure specification and including a selected value for an external condition;

- 5 (b) inputting a desired level for said external condition into said controller; and,
- (c) comparing said value with said level to create a command signal to said power supply or an external drive.

93. A method as defined in claim 92 including:

- (d) sensing the real time value of said external condition; and,
- (e) disabling said welder when said real time value deviates from said command signal by a selected amount.

94. A method as defined in claim 93 wherein said external conditions are selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.

95. A method as defined in claim 92 wherein said external conditions are selected from the class of travel speed of an external drive, wire feed speed of an external drive, arc current of said power supply, and arc voltage of said power supply.